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September 9, 2013

The Honorable Carl Levin
Chairman
The Honorable John McCain
Ranking Member
Permanent Subcommittee on Investigations
Committee on Homeland Security and Governmental Affairs
United States Senate

Space: Defense and Civilian Agencies Request Significant Funding for Launch-Related Activities

The Department of Defense (DOD) and National Aeronautics and Space Administration (NASA) rely on launch service providers to place payloads into orbit on a recurring basis. DOD and NASA are the nation's two "launch agents" as identified in the U.S. Space Transportation Policy. The agencies involved in space launch activities request funding each year to develop, procure, and support these activities. This funding represents a significant investment on the part of the government. However, because the agencies involved budget and account for their respective space launch efforts differently, the total governmentwide funding to support these activities is difficult to determine.

This report formally transmits the enclosed briefing with information on the launch-related funding that government agencies expect to require from fiscal years 2014 through 2018. We prepared this report as an initial step in addressing your broader request that we provide short- and long-term assessments examining impediments to economical procurement of government launch vehicles and launch services. Specifically, with this report, we address your interest in gaining more detailed knowledge about the amount and types of funding government agencies expect to allocate to launch-related activities and infrastructure for fiscal years 2014 through 2018. This information should help to inform plans to lower launch costs, increase competition, and invest in new programs.

To conduct this work, we obtained and analyzed DOD and NASA top-level budget documentation (along with relevant funding from other government agencies such as the National Oceanic and Atmospheric Administration that use either DOD or NASA as the launch agent for their satellites) and aggregated the total amount of funding the agencies expect to require for launch-related activities from fiscal years 2014 through 2018. For purposes of comparison between defense and civilian budget account types, we grouped DOD as well as civilian launch-related funding requests into three budget categories: Procurement; Research, Development, Test, and Evaluation (RDT&E); and Other. The budget category designated as "Other" includes DOD operations and maintenance, military construction, and military personnel, as well as NASA operations and support, construction of facilities, and civilian personnel. We discussed this methodology with DOD and NASA officials, who found it reasonable.

We conducted our work from June 2013 to September 2013 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the

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audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

In summary, defense and civilian government agencies together expect to require significant funding, nearly \$44 billion in “then-year” dollars that factor in anticipated future inflation, for launch-related activities from fiscal years 2014 through 2018. Procurement funding represents about \$28 billion—some 65 percent—of this total, while RDT&E constitutes approximately \$11 billion, or about 26 percent. Both DOD and NASA anticipate that procurement funding needs will increase over the 5-year period, with DOD planning for costs associated with its Evolved Expendable Launch Vehicle Program—which acquires launch vehicles for U.S. military and intelligence satellites—and NASA for the transport of crew and cargo to the International Space Station. Overall, DOD’s launch procurement needs exceed NASA’s—about \$16 billion total to NASA’s \$12 billion. In contrast to procurement, the agencies indicate that together their need for RDT&E funding will decrease during the same period. NASA’s expected RDT&E launch funding requirements outpace DOD’s, with the agency planning to spend about \$10.5 billion for launch-related development from fiscal years 2014 through 2018. Of that amount, NASA anticipates the need for approximately \$7 billion for the development of its own deep space launch vehicle known as the Space Launch System, and the associated ground systems, to support human deep space exploration. NASA’s RDT&E funding needs drop off beginning in fiscal year 2016 due to decreased investment in the commercial crew program, which funds commercial development of human spaceflight systems to support the International Space Station in low Earth orbit. DOD is not investing heavily in RDT&E from fiscal year 2014 through 2018 and has budgeted about \$719 million total for launch development efforts during those years.

For additional information on the results of our work, see the briefing included as enclosure I.

Agency Comments

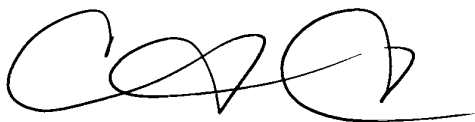
We are not making recommendations in this report. We provided a draft of this report to DOD, NASA and the National Oceanic and Atmospheric Administration for comment. These agencies provided technical comments that were incorporated as appropriate in the final report.

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We are sending copies of this report to the appropriate congressional committees; the Secretary of Defense; and the NASA Administrator. This report will also be available at no charge on our website at <http://www.gao.gov>.

Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report were Art Gallegos, Assistant Director; John Warren; Tana Davis; Pete Anderson; and Marie Ahearn.

Should you or your staff have questions concerning this report, contact Cristina T. Chaplain at (202) 512-4841 or at chaplainc@gao.gov.



Cristina T. Chaplain
Director, Acquisition and Sourcing Management

Enclosure



Space: Defense and Civilian Agencies Request Significant Funding for Launch-Related Activities

**Briefing for the Permanent Subcommittee on
Investigations,
Committee on Homeland Security and
Governmental Affairs, United States Senate**

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Introduction

- The Department of Defense (DOD) and the National Aeronautics and Space Administration (NASA) are the nation's two "launch agents" as identified in the U.S. Space Transportation Policy.
 - The Secretary of Defense is the launch agent for the National Security Sector.
 - The NASA Administrator is the launch agent for the nation's civil sector, which supports customers such as the National Oceanic and Atmospheric Administration (NOAA).
- DOD and NASA request funding each year to develop, procure, and support space launch activities. This funding represents a significant investment on the part of the government. However, because the agencies involved budget and account for their respective space launch efforts differently, the total governmentwide funding to support these activities is difficult to determine.
- For the launch of U.S. government satellites, both the DoD and NASA primarily rely on U.S. commercial launch service providers to place their payloads into orbit.
- NASA is also developing the new deep space launch vehicle, known as the Space Launch System, to support human exploration, and to continue to support the research on board the International Space Station through crew transport and cargo resupply.



Objective

- The Senate Homeland Security and Governmental Affairs Permanent Subcommittee on Investigations requested that we provide short- and long-term assessments examining impediments to economical procurement of government launch vehicles and launch services across government. In this initial assessment, we reviewed the Fiscal Year (FY) 2014 President's Budget request and identified, quantified, and analyzed the amount of funding requested for space launch–related activities across the government. This briefing contains the results of our analysis.



Scope and Methodology

- This briefing was prepared based on defense and civilian funding requests as presented in the FY 2014 President's Budget. Specifically, we reviewed FY 2014 through FY 2018 space launch-related funding requests by NASA, NOAA, and DOD, including the military services and other offices. Dollar amounts presented in this briefing are derived from the President's Budget request; therefore, all dollars presented are then-year dollars; that is, they factor in anticipated future inflation. Then-year dollars are sometimes called 'current dollars,' 'nominal dollars,' 'budget dollars,' or 'fully inflated dollars.'
- We first obtained both defense and civilian launch-related funding requests from FY 2014 through FY 2018 in the budget categories of procurement; research and development; operations and maintenance/support; construction; and personnel. We then asked the respective agencies to identify launch-related funding within these same fiscal years and budget categories. We assessed the reliability of the requested funding data, and found them to be sufficiently reliable for reporting on expected future requests.
- For purposes of comparison between civilian and defense budget account types, we grouped DOD as well as civilian launch-related funding requests for NASA and NOAA into three budget categories: Procurement; Research, Development, Test and Evaluation (RDT&E); and Other. The budget category designated as Other includes DOD operations and maintenance, military construction, and military personnel, as well as NASA operations and support, construction of facilities, and civilian personnel. We discussed this methodology with DOD, NASA, and NOAA officials, who found it reasonable.

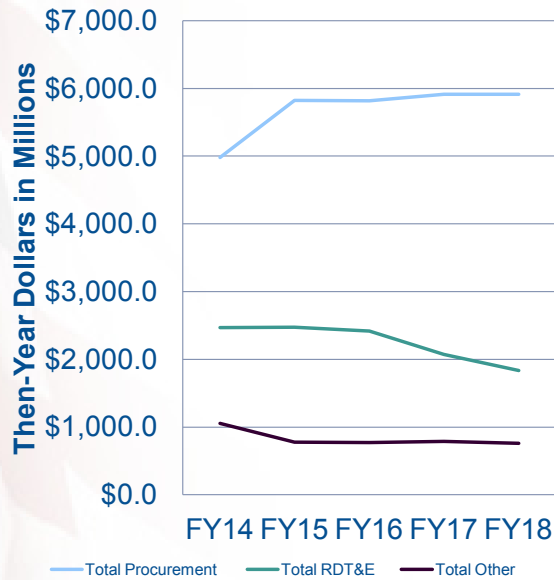


Scope and Methodology

- In some instances, we could not separate launch costs from certain non-launch-related activities. Specifically, NASA was unable to separate launch costs from International Space Station cargo and crew transportation costs. In these instances, all cargo and crew transportation costs are included in launch costs. Further, the funding for NASA's Science Mission Directorate is based on a per-year estimate of launch costs provided by NASA.
- NOAA was unable to provide new estimates of launch-related funding requested in the FY 2014 President's Budget in time to be included in this briefing. Therefore, we used numbers NOAA had previously provided based on the FY 2013 President's Budget request as representative of NOAA's investment. The impact of including the FY 2013 President's Budget numbers for NOAA was minor because they represent a relatively small portion of the total NASA request. Because NASA acts as the launch agent for NOAA, we did not break out NOAA funding from NASA funding in our presentation of governmentwide procurement funding.
- We conducted this performance audit from June 2013 to September 2013 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

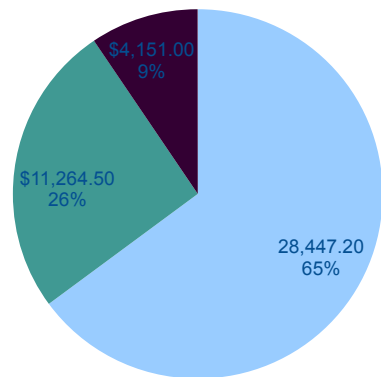


Governmentwide Launch Funding By Category, FY14-18



Source: GAO analysis of agency data.

Then-Year Dollars in Millions



Legend: Total Procurement (blue square), Total RDT&E (green square), Total Other (dark red square)

Source: GAO analysis of agency data.



Governmentwide Launch Funding Totals by Fiscal Year

Then-Year Dollars in Millions

	FY14	FY15	FY16	FY17	FY18	Total
Procurement	\$4,981.4	\$5,819.7	\$5,816.2	\$5,914.4	\$5,915.5	\$28,447.2
RDT&E	\$2,469.0	\$2,473.0	\$2,414.6	\$2,073.9	\$1,834.0	\$11,264.5
Other	\$1,053.5	\$774.3	\$770.7	\$790.0	\$762.5	\$4,151.0
Total	\$8,503.9	\$9,067.0	\$9,001.5	\$8,778.3	\$8,512.0	\$43,862.7

Source: GAO analysis of agency data.

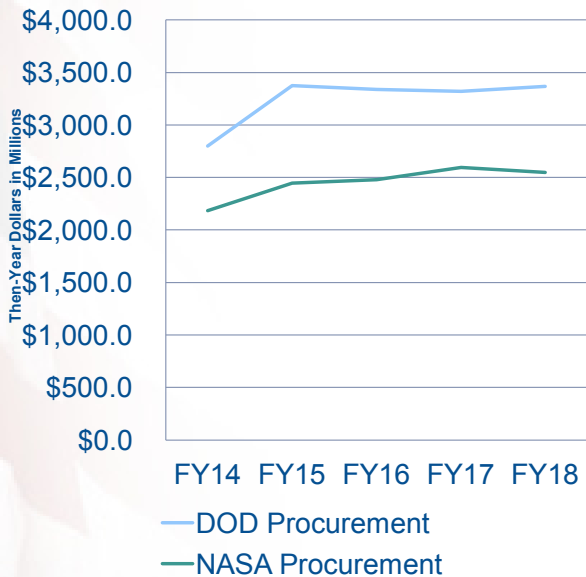


Details on Governmentwide Launch Funding FY 14-18

- Governmentwide launch funding totals nearly \$44 billion for FY 14-18.
 - Procurement is about 65 percent of this funding.
 - Annual procurement funding requests trend upward at DOD and NASA, increasing by nearly \$1 billion total (\$4.98 billion in FY 14 to \$5.92 billion in FY 18).
 - Procurement funding is more than double Research, Development, Test, and Evaluation (RDT&E) funding.
 - RDT&E is about 26 percent of this funding.
 - Total requested RDT&E for launch-related activities is relatively flat at about \$2.4 billion from FY 14 through FY 16, but decreases in FY 17 and FY 18.
 - DOD is not currently investing in RDT&E for new launch vehicles; NASA is investing heavily in RDT&E for the Space Launch System (SLS).
 - Funding for “Other” activities is about 9 percent of this funding.
 - After FY 14, “Other” funding, such as personnel and facilities remains essentially flat from FY 15-FY 18.
 - Both DOD and NASA are acquiring launch vehicles via launch services contracts.



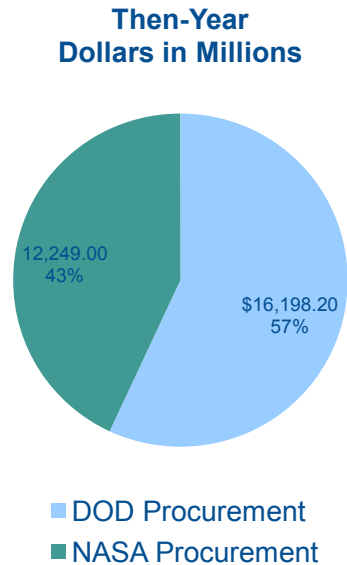
Governmentwide Launch Procurement: NASA & DOD Portions FY 14-18



Source: GAO analysis of agency data.

Source: GAO analysis of agency data.

Note: NASA procurement includes NOAA funds to procure launch vehicles for weather satellites.





Governmentwide Launch Procurement Totals FY 14-18

Then-Year Dollars in Millions

	FY14	FY15	FY16	FY17	FY18	Total
DOD Procurement	\$2,799.3	\$3,373.3	\$3,338.5	\$3,319.8	\$3,367.3	\$16,198.2
NASA Procurement	\$2,182.1	\$2,446.4	\$2,477.7	\$2,594.6	\$2,548.2	\$12,249.0
Total Procurement	\$4,981.4	\$5,819.7	\$5,816.2	\$5,914.4	\$5,915.5	\$28,447.2

Source: GAO analysis of agency data.

Note: Totals may not match due to rounding. NASA procurement includes International Space Station crew and cargo transportation costs which are broader than only launch vehicle costs. It also includes NOAA funds to procure launch vehicles for weather satellites.



Details on Governmentwide Launch Procurement Funding FY14-18

- Governmentwide launch-related procurement funding totals about \$28 billion FY 14-18.
- Procurement funding for launch-related activities, including procurement of launch services, is trending upward with annual funding increasing nearly 19 percent from FY 14 to FY 18.
- DOD procurement funding for the Evolved Expendable Launch Vehicle increases from FY 2014 to FY 2015 but remains relatively steady after 2015 and reflects savings achieved through a new multi-year block buy acquisition strategy.
- NASA anticipates increased procurement funding needs largely due to increased purchases of launch services for transport of crew and cargo to the International Space Station.

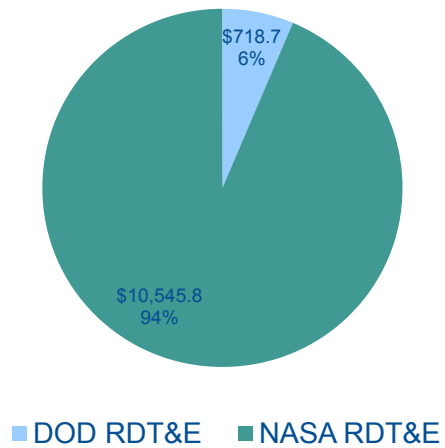


Governmentwide Launch RDT&E: NASA & DOD Portions FY14-18



Source: GAO analysis of agency data.

Then-Year
Dollars in Millions



Source: GAO analysis of agency data.



Governmentwide Launch RDT&E Totals FY 14-18

Then-Year Dollars in Millions

	FY 14	FY 15	FY 16	FY 17	FY 18	Total
DOD RDT&E	\$179.1	\$165.0	\$145.6	\$113.3	\$115.7	\$718.7
NASA RDT&E	\$2,289.9	\$2,308.0	\$2,269.0	\$1,960.6	\$1,718.3	\$10,545.8
Total RDT&E	\$2,469.0	\$2,473.0	\$2,414.6	\$2,073.9	\$1,834.0	\$11,264.5

Source: GAO analysis of agency data.

Note: Totals may not match due to rounding. NASA RDT&E funds for construction of facilities in FY15 through FY18 will be transferred to the "other" category as part of NASA's annual budget cycle.

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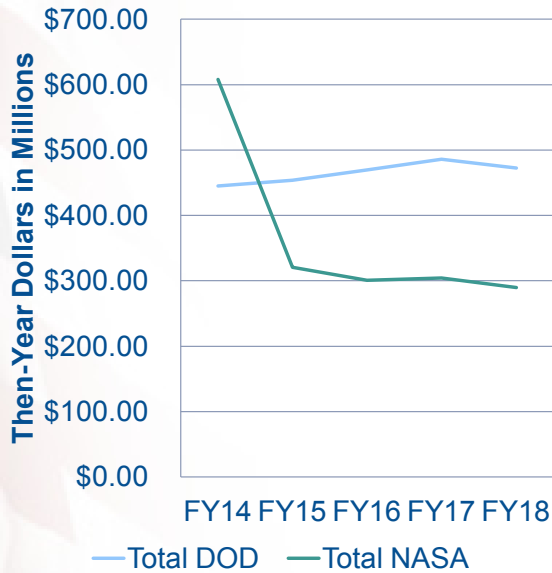
Details on Governmentwide Launch RDT&E Funding FY 14-18

- Governmentwide launch-related RDT&E funding totals about \$11 billion FY 14-18.
- From FY 14-18, NASA is requesting much more launch-related RDT&E funding than DOD due to SLS development:
 - NASA accounts for nearly 94 percent of governmentwide launch-related RDT&E funding.
 - NASA anticipates spending about \$10.5 billion in RDT&E funds from FY 14-18, while DOD expects to spend about \$719 million total.
 - NASA plans to spend the bulk of its FY 14-18 RDT&E funding, about \$7 billion, for development of the SLS and its associated ground systems.
 - NASA's planned annual RDT&E investment drops steeply, over \$300 million from FY '16 to FY '17, largely due to decreased funding for the Commercial Crew Program which funds commercial development of human spaceflight systems to support the International Space Station in low Earth orbit.
- Relative to NASA, DOD is not investing heavily in RDT&E from FY 14-18.
- As we previously reported in 2011, there have been concerns about the lack of concerted development and a strategic plan for science and technology efforts within the launch community.¹

¹ See GAO, *Space Research: Content and Coordination of Space Science and Technology Strategy Need to Be More Robust*, GAO-11-722 (Washington, D.C.: Jul 19, 2011).

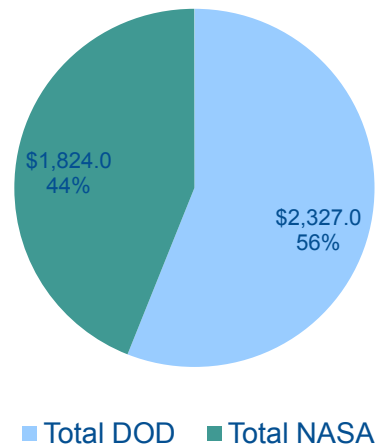


Governmentwide Launch Other: NASA & DOD Portions FY 14-18



Source: GAO analysis of agency data.

Then-Year Dollars in Millions



Source: GAO analysis of agency data.



Governmentwide Launch Other Totals FY 14-18

Then-Year Dollars in Millions

	FY14	FY15	FY16	FY17	FY18	Total
DOD Other	\$445.3	\$453.7	\$469.7	\$485.7	\$472.6	\$2,327.0
NASA Other	\$608.2	\$320.6	\$301.0	\$304.3	\$289.9	\$1,824.0
Total Other	\$1,053.5	\$774.3	\$770.7	\$790.0	\$762.5	\$4,151.0

Source: GAO analysis of agency data.

Note: Totals may not match due to rounding. NASA RDT&E funds for construction of facilities in FY15 – FY18 will be transferred to the "other" category as part of NASA's annual budget cycle.

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Details on Governmentwide Launch Other Funding FY 14-18

- Governmentwide launch-related “Other” funding totals about \$4 billion FY 14-18.
- “Other” includes several types of launch-related funding:
 - DOD
 - Operations and Maintenance, Military Personnel, and Military Construction
 - NASA
 - Civil Service Personnel, Operations and Support, and Construction of Facilities
- DOD and NASA FY14-18 funding for “Other” remains relatively flat by fiscal year after FY 14.



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